Listing of Claims

Please cancel claims 1-16 without prejudice and add claims 18-37 as follows:

1-17. (Cancelled)

18. (New) A method of transmitting packets from devices to output ports, the method comprising:

providing a plurality of requests to transmit data packets from a plurality of devices, wherein each request corresponds to one of a plurality of input queues of one of the devices and includes an output port identifier for transmitting data packets to one of a plurality of output ports;

receiving the requests in parallel at respective inputs of a plurality of allocation stages, wherein an output of each stage is connected to an input of a subsequent stage;

at least one of the allocation stages performing a matching based on the requests to generate one of a partial matching information or a complete matching information, wherein the partial matching information is a matching of less than all the requesting devices to a corresponding one of the output ports and the complete matching information is a matching of all the requesting devices to a corresponding one of the output ports; and

granting permission to an input queue of each of the requesting devices for a corresponding one of the output ports using the completed matching information from the last stage.

19. (New) The method of claim 18, further comprising transferring the partial matching information from a stage of the plurality to a subsequent stage of the plurality.

20. (New) The method of claim 18, further comprising transmitting the data packets from each of the input queues that were granted permission to a corresponding one of the output ports.

21. (New) The method according to claim 19, further comprising:

providing a second plurality of requests to transmit a data packet from the plurality of devices, wherein each request corresponds to one of the plurality of input queues of one of the

devices and includes an output port identifier for transmitting a packet to one of a plurality of the output ports;

receiving the second requests in parallel at respective inputs of the allocation stages that have not received the partial matching information;

continuing the prior matching in each of the stages that received the partial matching information to generate one of the completed matching information or the partial matching information; and

performing a second matching based on the second requests in each of the allocation stages that received the second requests to generate one of a second completed matching information or second partial matching information.

22. (New) The method of claim 21, wherein the matching is performed in a first thread during a period of time and the second matching is performed in a second thread during the same period of time.

23. (New) The method of claim 18, wherein the transferring of the partial matching information from a stage of the plurality to a subsequent stage of the plurality is further based on the number of requests that are pending.

24. (New) The method of claim 18, wherein the transferring of the partial matching information from a stage to a subsequent stage is further based the position of the stage.

25. (New) An arbitration unit comprising:

a plurality of allocation stages connected in series, wherein an output of each stage is connected to an input of a subsequent stage;

a request unit providing requests to transmit data packets from a plurality of devices in parallel to the input of each of the stages, wherein each request corresponds to one of a plurality of input queues of one of the devices and includes an output port identifier for transmitting data packets to one of a plurality of output ports;

a grant unit connected to an output of the last stage, the grant unit providing matching information from the last stage to the input devices,

wherein each stage is configured to perform a matching based on the requests to generate the matching information, wherein the matching information is a matching of the requesting devices to a corresponding one of the output ports.

26. (New) The arbitration unit of claim 25, wherein the stages are configured to perform the matching iteratively based on the received requests and partial matching information provided from a previous stage.

27. (New) The arbitration unit of claim 25, further comprising an allocation unit to allocate the data packets of an input queue of an input device to a corresponding output port based on the matching information.

28. (New) The arbitration unit of claim 26, wherein at least one of the allocation stages comprises:

an allocator to perform the matching; and

a prefilter to perform one of a forwarding of the requests to the allocator or a forwarding of modified information to the allocator, wherein the modified information is based on the requests and the partial matching information.

29. (New) The arbitration unit of claim 28, wherein prefilter determines whether to forward the modified information based on a current matching in the partial matching information.

30. (New) The arbitration unit of claim 28, wherein the prefilter determines whether to forward the modified information based on the number of requests that are pending.

31. (New) The arbitration unit of claim 28, wherein the prefilter determines whether to forward the modified information based on the position of the stage.

32. (New) The arbitration unit of claim 28, wherein at least one of the allocation stages further comprises a postfilter unit for filtering out at least one match in the matching information.

33. (New) The arbitration unit of claim 25, wherein the request unit comprises a plurality of counters, wherein each counter corresponds to one of the input queues for each of the input devices for counting the number of pending requests from a particular queue.

34. (New) The arbitration unit of claim 25, furthers comprises a selection unit to selectively provide the requests in parallel to each of the allocation stages.

35. (New) A method of granting permission to virtual queues that request permission to transmit data packets to output ports, the method comprising:

transferring partial matching information from each stage of a plurality of allocation stages to a subsequent stage, wherein an output of each stage is connected to an input of a subsequent stage and the partial matching information includes a partial mapping of the virtual queues to respective output ports;

providing a plurality of requests to transmit data packets from the virtual queues, wherein each of the requests includes an output port identifier of one of the output ports;

receiving the requests in parallel at respective inputs of at least one consecutive stage of the allocation stages;

generating first matching information by matching at least one of the virtual queues to a corresponding one of the output ports from the requests in the at least one consecutive stages and generating second matching information by matching at least one of the virtual queues to a corresponding one of the output ports from the partial matching information in the remaining stages; and

transferring grant permission information to the virtual queues based on the second matching information.

36. (New) The method of claim 35, wherein the second matching information is output from the last stage of the allocation stages.

37. (New) The method of claim 35, wherein transferring of the partial matching information from

each stage to a subsequent stage is based on the position of the stage.